Canal Towns
Alexandria and Saltsburg
Huntingdon and Indiana Counties
Pennsylvania

HABS No. PA-5666

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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HISTORIC AMERICAN BUILDINGS SURVEY

CANAL TOWN DEVELOPMENT IN PENNSYLVANIA

HABS No. PA-5666

INTRODUCTION

Dozens of towns along the rivers between Pittsburgh and Philadelphia blossomed with the introduction of the Pennsylvania Main Line Canal in the third decade of the nineteenth century. This first major east-west transportation route linked the East Coast and its waterways with the inland Great Lakes and Mississippi River, thus opening up Pennsylvania west of the formidable Allegheny Mountains. The singularly significant canal era lasted only about twenty years, until mid-century when the railroad was introduced as a direct competitor. Rail transportation quickly dominated shipping by water, and after the Pennsylvania Railroad Company acquired both entities, the canal facilities were gradually eliminated. The railway continued to sustain the economies of small towns, such as Alexandria and Saltsburg, that developed and were dependent upon the export of natural resources and some manufactured products. While the railroad literally obliterated its predecessor, and many of its own branch lines were phased out during the twentieth century, the localities of western and central Pennsylvania nonetheless owe their heritage to these all-important nineteenth-century engineering accomplishments.

This overview summarizes the history of the southwestern Pennsylvania region from colonial settlement to the development of increasingly sophisticated transportation systems, and industrialization of the Juniata and Conemaugh river valleys, while taking into account the ethnic, religious, and social fabric shared by the towns--including Saltsburg and Alexandria. This context is intended to clarify and elaborate on the architectural heritage of the area, with its strong Germanic-Scotch tradition, as it was absorbed into larger, national influences.

EARLY PENNSYLVANIA SETTLEMENT

Settlement of inland areas as far west as Pennsylvania occurred after East Coast and other land accessed by waterways was already populated. The reasons were simple: native, often hostile, Indians inhabited the territory; a limited number of men were available to establish settlement villages; and the topography itself was treacherous and difficult to traverse.

When whites began to venture into central and western Pennsylvania in the mid- eighteenth century, the primary mode of transportation was by small river craft or by foot along narrow Indian trails. The first settlers in the region took to the banks of the Susquehanna and Allegheny rivers. As whites interacted with Indians enroute westward, they widened their trails to accommodate pack animals, and these came to be known as bridle paths.[1] Unlike settlers who arrived with the intention of creating a homestead, the earliest traders did not clear the land or build substantial dwellings; they stayed in a spot called a log or sleeping place. This may account for the story of John Hart who, according to legend, traded with western Pennsylvania Indians until the 1750s; the site where he is

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1 George Swetman, Pennsylvania Transportation, Pennsylvania Historical Studies No. 7 (Gettysburg: Pennsylvania Historical Association, 1968), 6.

said to have fed and salted horses, "Hart's Log," became the founding tract of Alexandria. Little physical evidence remains from this era, however: "There were no inns on the road in those days, nor a habitation west of the mountains, save perhaps, a hut or two at Fort Ligonier."[2]

Squabbles over the interior regions of the colonized New World were initially an international contest. During the French and Indian War, the French and British troops utilized their Indian allies for combat, and western Pennsylvania was enveloped in the scrimmage. Both forces sought settlement rights to land west of the Ohio River, and the subsequent control over this waterway for purposes of trade, communication, and settlement. France controlled land in Canada and Louisiana, between which the Ohio River was a critical link. The British, who owned land east of the Ohio River, were unwilling to risk separation from what promised to be a profitable commercial endeavor. Settlers caught in the fray often found it prudent to move eastward to avoid the battles over control of the forts along the Ohio and Mississippi rivers until after the war. The minority of white settlers who remained behind simply attempted to protect their homes from attack.

In 1775, General Braddock led militia across Pennsylvania to capture the French Fort Duquesne. His defeat on July 9, 1775, exposed the western territories to further attack. The French retained control until 1758, despite a handful of British victories. Montreal, Canada, fell in September 1760, and the Treaty of Paris, signed in 1763, officially ended the war, and the French ceded their North American territories to the British. Intercontinental peace may have been technically restored, but the colonists who returned to the frontier found still-hostile Indians and little remains of their crude settlements.

The Proclamation of 1763 had established the Allegheny Mountains as the western boundary of British colonial land holdings. Complaints by various tribes in the ensuing years concerned the growing number of white squatters. In response, Governor Penn in 1766 forbade settlement west of the treaty line; the penalty for trespassing was strict, but not harsh enough to discourage the practice.[3]

In fall 1768, the British and the Six Nations of the Iroquois Confederacy signed the Treaty of Fort Stanwix, in which the latter ceded the land south of the Ohio River and east of the Alleghenies as far as Fort Pitt. Although doubt existed concerning the Iroquois's right to sell land occupied by the Shawnee, Delaware, and other tribes, settlers rushed westward to speculate and to survey new land.[4] Over the next decade, the Revolutionary War again halted most new settlement efforts, with many families forced back to more secure locales or residing within the walls of nearby forts.[5] Even after the Second Treaty of Fort Stanwix was signed in 1787 and the remaining land within the boundaries of the state was acquired, Indian uprisings continued, and settlers sought refuge in blockhouses, fortifications constructed of stacked planks or logs.[6]

Between 1770 and 1794, Indian uprisings and turmoil associated with the French and Indian

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[2] William H. Egle, An Illustrated History of the Commonwealth of Pennsylvania (Harrisburg: Dewitt C. Goodrich and Co., 1875), 793.

[3] Clarence D. Stephenson, Indiana County 175th Anniversary History (Indiana, Pa.: A.G. Halldin Publishing Co., 1978), 64; hereafter cited as 175th.

[4] Stephenson, 175th, 114.

[5] Egle, 782.

[6] Stephenson, 175th, 114-15.

War and the Revolutionary War contributed to the sluggish influx of settlers. Further disputes between Indians and whites were diminished by the Treaty of 1795.[7] Living conditions were crude and difficult, thus few buildings erected prior to the early decades of the nineteenth century remain intact.

ARCHITECTURAL TRADITION

The ethnic makeup of the late-eighteenth and early-nineteenth-century immigrants to central and southwest Pennsylvania was largely homogeneous--German, Scotch and Irish. The similarity of their native homelands to Pennsylvania's rugged but fertile geography meant that their traditional types of houses and farm structures translated well using the materials at hand in their new home. Pennsylvania has long been credited with having a strong and distinct history of vernacular architecture, even after it began to mingle with nationally popular American styles such as Greek Revival, Federal, and Georgian. Field stone and red brick are common building materials--sometimes covered with stucco or painted--used for the typically two-story dwellings and commercial buildings. It would seem the construction skills introduced to Alexandria and Saltsburg by canal engineers and masons would have resulted in more stone buildings than history substantiates; exant examples are found in Saltsburg's William McIlwaine House (ca. 1827-40s) and the 105 Point Street House (ca. 1830), and Alexandria's John Cresswell House (ca. 1816).

The downtown residential and commercial buildings erected from the early-nineteenth century generally reflect similar plans, proportions, and decorative features. Arranged on an L-shaped or rectangular plan with the ridge line parallel to the street, windows and doors are most often symmetrically arranged. In larger dwellings these were four to six bays across, on a center-hall plan; in an abbreviated form this becomes a two-thirds Georgian, or three-bay side-hall plan; both are commonly double pile, or two rooms deep. Chimneys are found on the interior of one or both gable ends.[8] It is common to find a centered or full one-story porch on the primary facade, as well as on the interior rear side of the one- or two-story ell, which often served as the kitchen or a similar service function. In Pennsylvania a "double house" was a bilaterally symmetrical building occupied by two families, although these are less common than traditional side-passage or center-passage plans. Typically, all these buildings were erected close together like rowhouses, and similarly pressed forward on the site as close as possible to the street, despite the availability of adequate land to do otherwise.

As town planning developed, so did a pattern of characteristics common to southwestern Pennsylvania. Unlike other regions of the country, different types of buildings --dwellings, stores, churches, civic structures--are jumbled together in a townscape without any schematic significance or hierarchy. One exception is the "diamond," an open space formed in the void of a right-angle intersection of streets that incorporates the corners of adjacent blocks. Alexandria contains a diamond that is located away ftom the downtown and canal route, which is unusual, since the diamond was intended to develop into a central downtown area. Open markets and other community events were hosted here, as well as providing a suitable open space for parking wagons and carts. Alleys also play an important role in the regional pattern of town planning. These are unusually formal, often named, and are reminiscent of a mews or close, and they allow each residence a generous rear egress. After 1830 when the national and international influences that arrived via the canal, railroad, and general midwestern development inundated small towns such as Alexandria and Saltsburg, these strictly

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[7] C.T. Arms and Edward White, 1745-1880 History of Indiana County, Penn'a (Newark, Ohio: J.A. Caldwell, 1880), 380.

[8] Henry Glassie, "Eighteenth-Century Cultural Process in Delaware Valley Folk Building," Winterthur Portfolio 7 (1972), 38.

Pennsylvanian architectural traits are lost to a more anonymous style of building.[9]

TRANSPORTATION

River Routes

As peace was gradually established in Pennsylvania, settlement resumed with a vigor. A steady stream of hopeful immigrants led the General Assembly in 1771 to designate as "public highways" the Juniata, Kiskiminetas, and the west branch of the Susquehanna rivers; the Conemaugh River was added to the list in 1787. In 1791 an act was passed that would penalize anyone caught obstructing these waterways, as well as authorizing the removal of rocks and other natural materials that obstructed the river's flow and endangered proper navigation.[10] In 1794 the General Assembly provided the financing to make these improvements.

Traversing the rivers was accomplished by ferry, ford, or bridge, the last so prevalent in Pennsylvania it is described as the "state of bridges."[11] A ferry serviced Saltsburg during the second decade of the nineteenth century, and another was operated after the canal opened. Concurrent to the canal era there existed a ford in the Juniata River at Alexandria that led into Hartslog Street; this was usurped by a covered bridge built across the river in 1845 that led into Bridge Street. A similar bridge crossed the Kiskiminetas River at Saltsburg in 1842-43. Prior to the semblance of settlement introduced by the canal, there were few such examples of these travel amenities.

Roads

The existing Indian trails were adequate for initial settlement, but the early pioneers soon discovered that improved roads were needed to accommodate the onslaught of heavy traffic--wagons and carriages. Maintenance of the widened bridle paths, with little or no improvement made to the surface, fell to adjacent property owners. But the effort expended toward the primary tasks of clearing land, planting crops, and erecting basic dwellings left little time for local residents to spend fixing up the road. The Lancaster Pike, financed at the petition of Pennsylvania residents, is an exception that marks the beginning of the trend toward state- and privately developed roads. Funded in 1733 by the government, the pike was completed by 1741.[12]

The Revolutionary War necessitated a hiatus in road construction just when the central and western Pennsylvania regions needed these facilities most, but when the conflict was over, the problem of inadequate thoroughfares was quickly addressed.[13] In 1785 the General Assembly alloted £2,000 to finance the clearing of brush and boulders from highways between Cumberland County and Pittsburgh, which ignited an influx of German, Scotch, and Irish who would become the first permanent settlers in this region.[14] In 1787 President George Washington appointed a commissioner to survey a road from the Frankstown Branch of the Juniata River over the Allegheny Mountains to the navigable waters of

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9 Wilbur Zelinsky, "The Pennsylvania Town: An Overdue Geographical Account," The Geographical Review (April 1977), 133, 136, 144.

10 J. Simpson Africa, History of Huntingdon and Blair Counties, Pennsylvania (Philadelphia: Louis H. Everts, 1883), 30-31.

11 Fuller D. Wayland, A History of Pennsylvania (NY: Prentice-Hall, 1935), 672.

12 Swetman, 7.

13 Africa, 29.

14 Swetman, 11.

the Conemaugh River that very nearly followed the present-day U.S. Route 22. Until the advent of turnpikes, this was the primary east-west thoroughfare, extended in 1791 with the addition of a ferry route between the Juniata Valley and the Ohio River.[15]

Turnpikes

The turnpike, a more strictly developed road along which tolls are collected to defray the costs of construction and maintenance, originated in England where a bar or pike blocked the road until the toll was paid.[16] Revenue from a traveller's dining, lodging, and passenger services became vital revenue to commercial establishments along the turnpikes. Stagehouses or inns provided bed and board for travellers, as well as a change of horses.[17] Roadhouses accommodated wagons and drovers, while providing large yards to contain their animals. Neither approached luxurious lodgings, composed of only a kitchen, dining room, and a large saloon area. All guests slept on the floor using their own bedding; many such inns housed the proprietor and his family, as well.[18]

On February 24, 1806, Pennsylvania began accepting subscriptions for stock to finance construction of a turnpike between Harrisburg and Pittsburgh to pass through Bedford. The next year a commission was appointed to sell stock for another road to go from Harrisburg to Pittsburgh by way of Huntingdon and Lewistown. In 1810 the Huntingdon, Cambria and Indiana Turnpike Company was incorporated and authorized to construct a turnpike of the same name; by 1820-21 the road was completed over the seventy-seven miles between Huntingdon and Blairsville, at a cost of $200,000. A mile marker belonging to the route is extant in Alexandria where the pike became part of Main Street. Due to the scarcity of settlement prior to this period, growth of foundling towns and industries occurred primarily along these wilderness arteries.[19]

Turnpikes proved less than ideal constructions, however, as they were susceptible to decay from weathering, age, poor construction, and weighty loads. Turnpike companies found that in general the maintenance costs exceeded the profits from tolls, and many of these roads were allowed to fall into a state of neglect.

Canals

The boom in American canal construction began in the northeast and south--New York, Maryland, Pennsylvania, Virginia, the Carolinas--about 1800, as these areas sought transportation avenues into the territories of Ohio, Illinois, Kentucky and Indiana; U.S. ownership then extended as far west as the Mississippi River. The Erie Canal was the first large-scale, economically successful waterway in this country, though it was preceded by numerous local canals built much earlier.[20] As early as 1762 several merchants petitioned for a survey of the west branch of the Susquehanna River, hopeful of connecting it with the Ohio River as a supplemental route to the Forbes Road, which was nothing more than a bridle path. In 1771 the American Philosophical Society explored the Schuylkill and Susquehanna river valleys in a plan to connect these two rivers via the Swatara and Lebanon

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15 Swetman, 13; Africa, 30; Stewart, 45.

16 Swetman, 15.

17 J.T. Stewart, Indiana County, Pennsylvania: Her People, Past and Present (Chicago: J.H. Beers and Co., 1913), 46.

18 Stewart, 46.

19 Africa, 31-33.

20 William H. Shank, The Amazing Pennsylvania Canals (York: American Canal and Transportation Center, 1973), 5.

valleys.

Twenty years later, the legislature approved the incorporation of the Schuylkill and Susquehanna Navigation Company for "opening a canal and lock navigation" between the Schuylkill and the Susquehanna. Shortly thereafter another group, the Delaware and Schuylkill Navigation Company, was established to build a waterway between the Delaware River at Philadelphia to Norristown on the Schuylkill River. Both experienced financial difficulties, however, and they merged in 1811 into the Union Canal Company of Pennsylvania, which was authorized to build canals as needed across Pennsylvania. By 1828 the seventy-eight-mile canal (with ninety-three locks) between Reading on the Schuylkill, and Portsmouth (now Middletown) on the Susquehanna, was complete. During the early years of the nineteenth century a number of small, private canals continued to be built to facilitate local travel, but none approached the scope of a major east-west transportation route.[21]

Canal advocates in Pennsylvania stressed the inadequacies of rivers, turnpikes, and public roads during spring flooding and wintertime when ice was problematic. Canal travel could extend the shipping season to nine months, from March to November, as well as stimulate the market for mineral resources found along the corridor. European conflicts also magnified America's need to develop for itself domestic sources of raw materials and manufactured goods, and at the same time provide adequate means for the large volume of immigrants hopeful of settling the interior territory.

Westward migration was encouraged by a growing interest in the vast natural resources beyond the Allegheny Mountains, which offered potential competition with Atlantic Ocean and Great Lakes ports. Philadelphia was historically the No. 1 seaport in young America, followed by Baltimore and New York. The nation was fascinated by European canal systems as a viable means of shipping of raw materials to manufacturing centers, but not enough to support lobbying efforts such as that of David Reid, who introduced of the notion of a canal to the Pennsylvania legislature in 1813-14.[22] The commonwealth could not be wooed into financing such a costly and long-term project until the results were in of the model canal under way in New York.

The Erie Canal, connecting the Hudson River at Albany with Buffalo on Lake Erie was both precedent-setting and highly successful. Begun on July 4, 1817, and completed on November 4, 1825, the canal drew national attention as the first link between the Eastern Seaboard and interior Great Lakes, although it did not have any specific impact on the western portion of Pennsylvania. As inland traffic could now opt to go through New York State, overland routes to trading centers such as Philadelphia and Baltimore were affected and related profits dropped off.

Pennsylvania's interest was piqued by the Erie's accomplishments, and the Philadelphia-based Pennsylvania Society for the Promotion of Internal Improvements sent engineer William Strickland and his assistant, Samuel Honeywell Kneass, to study and record canals in Britain, Ireland, and Wales. In 1824 the General Assembly named a canal commission to investigate potential routes between Philadelphia and Pittsburgh, with specific attention paid to the Juniata and Conemaugh river valleys: its goal was to find a means of accessing the fertile territory beyond the mountains and availing it to settlers.[23] The one negative aspect of this route was a proposed four and one-half mile tunnel through

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21 Robert McCullough and Walter Leuba, The Pennsylvania Main Line Canal (York: American Canal and Transportation Center, 1973), 10-11.

22 Shank, 11; Stephenson, 175th, 316.

23 McCullough, 17-18.

the Allegheny Mountains with a canal trough elevated so high that a reliable water source was at risk; the task was beyond contemporary engineering technology.[24] But the promise of prosperity sure to be generated by a state-owned canal enticed local residents who insisted that this and alternative courses (seven in all) be re-examined.

PENNSYLVANIA MAIN LINE CANAL

The Erie Canal's rosy revenues, coupled with the comparable climatic and geographic characteristics of New York and Pennsylvania, were arguments touted by canal proponents. And Pennsylvania's recognized agricultural produce and extractive industries--salt, iron, and coal resources, in particular--were judged competitive with those of New York. Railroad advocates, on the other hand, insisted that Pennsylvania's mountainous terrain was not conducive to a canal and lock system, citing the efficiency of the fledgling rail transportation. (During the 1820s there were no railroad systems in the United States, although England--which led the world in developing rail transportation--could boast several facilities.) While impressive horsepower and tonnage figures ranked rail above canal transportation, Pennsylvanians at first balked at such an untried avenue, although two rail components were eventually incorporated into the main line system: the Columbia and Philadelphia Railroad and the Portage Railroad.

The pressure to compete intensified, and the state hastily chose to pursue canal construction using borrowed funds, without even first determining how to breach the Allegheny Mountains. On February 25, 1826, the governor authorized the creation of the Pennsylvania Main Line Canal, to connect Philadelphia and Pittsburgh via the Juniata and Conemaugh rivers; the first spadeful of dirt was turned in Harrisburg on July 4 of that year, with digging to commence at each end.[25]

It was not until 1828, however, that the Main Line was completely planned and organized into five divisions (Figure 2.1): three canal and two rail. The easternmost section of the main line comprised the Columbia Railroad, stretching eighty-three miles from Philadelphia to Columbia, located along the Susquehanna River. It connected with the Eastern Division, a forty-three-mile canal route between Columbia and Clark's Ferry. Linked by an aquaduct, the canal continued as the Juniata Division, stretching 127 miles between Duncan's Island and Hollidaysburg along the Juniata River. The Allegheny Portage Railroad carried passengers and boats the next thirty-seven miles over the Allegheny Mountains between Hollidaysburg and Johnstown. Traveling again by water, the 105-mile Western Division concluded the Main Line, making the connection between Johnstown and Pittsburgh along the Conemaugh and Kiskiminetas rivers. The system totalled 395 miles end to end.

The Eastern Division of the Main Line Canal was originally designed to intersect with the privately owned Union Canal at Middletown on the Susquehanna River; this was extended to Columbia, however, after 1828 when a rail link between Columbia to Philadelphia was considered.[26] Strickland and Kneass served as the engineers of its two dams, twenty-three locks and eight

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24 McCullough, 25.

25 Theodore Klein, The Canals of Pennsylvania and the System of Internal Improvements (Harrisburg: William Stanley Ray, 1901), 9.

26 Swetman, 57.

aqueducts.[27]

The Western Division, winding eastbound through the Conemaugh River Valley, proved more controversial than its eastern counterpart, and work commenced in 1826 before the Pittsburgh terminus was precisely settled upon. A year later the canal was extended to Blairsville; and in 1828, to Johnstown.[28] All but the last five miles at the Pittsburgh terminus commenced immediately, because although the canal was supposed to fall within that city's limits, the engineers thought a better route might take it to the nearby village of Allegheny. Pittsburghers rightfully protested, and in a compromise move the commission extended the canal to the shore opposite the city and crossed over; and a branch canal continued another mile or so to the Borough of Allegheny. Nathan Roberts, George T. Olmstead, Alonzo Livermore, and later Moncure Robinson served as engineers on this division, which included ten dams, sixteen aqueducts, sixty-four locks, two tunnels, and sixty-four culverts.[29]

In 1827 the Juniata Division became the last of the three canal segments authorized, initially to connect Clark's Ferry and Lewistown via the Juniata River Valley; and later extended to Huntingdon, Frankstown, and still further to Hollidaysburg.[30] It proved the most difficult to develop because the channel followed valleys and bisected mountains, and the sharp Hollidaysburg elevation demanded construction of a reservoir. As a result, this section caused the highest incidence of damage to the private property of adjacent landowners and it cost the most to build. Dewitt Clinton Jr., who had worked on the Erie Canal, was one engineer on
this division, whose components included sixteen dams, eighty-eight locks and twenty-five aqueducts.[31]

Allegheny Portage Railroad

Construction on the Allegheny Portage Railroad, the first "artificial means of communication" between the East and the Mississippi Basin, did not commence until March 1831, a few years after the canal proper was in operation.[32] The idea for a tunnel through the Alleghenies had been quickly discarded in favor of a novel counter-weighted rail route over the mountains. The Allegheny Portage Railroad, largely the project of engineers Moncure Robinson and Sylvester Welch, consisted of a series of inclined planes connected with grades.[33] The path was cleared of timber and the terrain graded to produce a uniform slope for each of the ten inclines and levels in between. Records of 1875 indicate the distances of each incline[34]:

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27 Archer Hulbert, The Great American Canals I, vol. 13 (Cleveland, 1902-05), Historic Highways of America; reprint (NY: AMS Press, 1971, 211-215.

28 McCullough, 49, 51.

29 Clarence D. Stephenson, Pennsylvania Canal: Indiana and Westmoreland Counties (Marion Center: Author, 1961), 2; McCullough, 53.

30 McCullough, 41.

31 McCullough, 44-45.

32 Hulbert, 195-96.

33 McCullough, 62.

34 H.W. Schotter, The Growth and Development of the Pennsylvania Railroad Company (Philadelphia: Allen, Line and Scott, 1927), 18.

Incline	Length (feet)	Rise (feet)
1 (Johnstown)	1,607	150
2	1,760	132
3	1,480	130
4	2,195	187
5	2,628	201
Summit	-	-
6	2,713	266
7	2,655	260
8	3,116	307
9	2,720	189
10 (Hollidaysburg)	2,295	180

A stationary engine located at the head of each incline assisted with the ascent and descent of cars. Hemp rope used initially was replaced in 1844 with less expensive wire rope designed by Brooklyn Bridge builder and engineer John Roebling. The cable was used experimentally on No. 10, and by 1849 was in place on all of the inclines.[35] In October 1834 the Lackawanna-based keelboat "Hit or Miss" became the first vessel to cross the Alleghenies. The cars were first hauled across the grades by horses, and later by wood-burning steam locomotives.[36] The total cost of this segment, $8.4 million, represents the bulk of the cost of the entire main line, and it was the first unit to be closed.[37]

As a result, the towns of Hollidaysburg and Johnstown, on the east and west termini of the Portage Railroad, respectively, became important shipping centers. "The opening of the canal to Hollidaysburg marked the beginning of the rapid and substantial growth enjoyed by that town for two decades," noted one contemporary.[38] The economic and physical growth they experienced was evident in new warehouses and industrial structures, as well as housing for locally based managers and laborers, and inns and saloons that served the migrating population. Both towns became economic, political, and social centers thanks to their location along the canal.

Columbia-Philadelphia Railroad

The Columbia and Philadelphia Railroad was conceived to replace the privately owned Union and Schuylkill Canal from Columbia to Philadelphia. Unlike the Allegheny Portage Railroad, the Columbia Railroad had only two inclined planes. The Belmont Plane, 2,805 feet long and 187 feet high; and the second plane, which descended into the basin at Columbia, 1,800 feet long and 90 feet high.[39] Rail travel was considered hazardous because of numerous curves, inadequate viaducts, and frequent accidents. Coupled with this division's inability to support a large quantity of traffic, a backlog was created and competing routes were developed that bypassed the Columbia-Philadelphia line.[40]

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35 Harry A. Jacobs, The Juniata Canal and Old Portage Railroad (Hollidaysburg: Blair County Historical Society, 1941), 6.

36 Jacobs, 4.

37 Hulbert, 211.

38 Africa, 36.

39 McCullough, 69.

40 McCullough, 144-45.

With its completion on April 15, 1834, the canal was credited with much of the growth that occurred along this corridor between 1825 and 1855.[41] Small settlements became established towns and small-scale industries blossomed into economically feasible ventures. The canal was a great improvement over transportation by pack mule and wagon.

But while individual towns prospered, the state was facing an escalating debt. In 1834, concurrent with advancements in railroad technology, the canal was already a financial disappointment. At a cost to-date of $22 million, the state owned 601 miles of canal and 119 miles of rail line. The burden of the former was outpacing even the growing recognition of railroad superiority. Remarked Governor Ritner in his final address:

> I once thought that no combination of circumstances would cause me to even hesitate in advocating the speediest means that could be devised for the completion of our noble system of improvement [the Main Line Canal]; but the experience of the past two years has, I confess, shaken my confidence in the attainment of this desirable end, within any reasonable period.[42]

Canal Construction and Technology

The canal-construction process was beset immediately with problems. Although many of the engineers were qualified by previous experience building the Erie Canal, the contractors who bid on sections of the main line were novices, and the lowest bidder received the contract. Unforeseen expenses often resulted in the contractor abandoning the project; the canal commissioners were then forced to relet the contract for a higher price, often to the same individual. In addition there were repeated incidents of poor workmanship and labor woes; in the semi-wilderness setting, diseases such as malaria and typhoid, frequently called "canal fever," plagued the low ground and river valleys where the canal was being built, and cholera outbreaks were recorded in 1832 and 1849.[43]

The frustration that resulted from generally poor management and construction was intensified by unskilled and uneducated laborers who were difficult to control. The large gangs who worked on the canal wreaked repeated havoc at local towns and farms in the form of drunkenness, looting, and brawling. They were predominantly Irish immigrants who were "largely illiterate, Roman Catholic, and full of the brogue," from whom their predecessors, the Scotch-Irish Presbyterian settlers, quickly differentiated themselves. Many had little to lose, having fled the potato famine in Ireland, and were willing to accept the poor working conditions, limited diet, and low wages. In the course of a twelve-hour workday, each man was expected to dig the equivalent of a yard of canal, compensation for which was 75-87 cents.[44]

The canal was built level so the water did not drain from the channel. Boats were easily pulled along the shallow cavity by a mule walking slightly ahead, along the adjacent towpath. When the gradient became too great, a lock system was constructed similar to a series of steps. The Pennsylvania Main Line Canal had many components: 175 locks, twenty-eight dams, and forty-nine

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41 Hulbert, 215; McCullough, 72.

42 McCullough, 31-32.

43 Peter A. Wallner, "Politics and Public Works: A Study of the Pennsylvania Canal System, 1825-1857," Ph.D diss, Pennsylvania State University, 1973; 78.

44 McCullough, 51-54.

aqueducts, as well as numerous slackwater pools, waste weirs, bridges, reservoirs, feeder canals, weigh locks, tunnels, basins and, in Johnstown, the ingenious Portage Railroad with its accompanying viaducts and inclined planes.[45]

The majority of locks were constructed of water-tight layers of timber, while some were more substantial cut and rubble-stone masonry. The standard lock on the Juniata River measured approximately 15 feet by 90 feet, two feet narrower than elsewhere in the Eastern Division; and each had a 4 feet by 2 feet spillway, or flume, along the upward slope with shut-off gates to regulate the water flow.[46] The canal and its traffic were frequently victimized by inclement weather: one June day in 1838, for example, severe rainfall caused the Juniata River to wash away nearly every lock, aqueduct, and dam between Huntingdon and Hollidaysburg; and repairs were not complete, nor shipping resumed, until the end of that season.[47]

Each lock was basically a chamber that could be closed with watertight gates on both upstream and downstream sides. If a boat was moving upstream, those gates were closed and the lower ones opened, allowing the water level to drop until it equalled that of the boat. The vessel would then be towed into the lock and the lower gates would be shut behind it. The upper gates would be opened and the water allowed to enter until the boat reached the higher level; the gates would then be opened and the vessel towed into the canal.

Individual locks were operated by a lockkeeper who was housed, rent-free in a nearby lockhouse. These dwellings were designed on a variety of simple plans, typically built on a lot owned by the state. The lockkeeper was an important source of information, since he was in contact with travellers from all parts of the country and Europe.[48] At peak season boats passed through every fifteen to twenty minutes, for a total of more than 3,600 westbound crafts a year. Although many of the locks themselves have been destroyed during intervening years, extant lockhouses such as the one in Alexandria face the old canal route. Rules for navigating the canal were established by the Board of Canal Commissioners. Packet-boat speed limits were set at four miles per hour, with lighter crafts permitted to go somewhat faster, with passenger boats having the right of way; violation of these regulations resulted in fines.[49] A canal-boat trip between Philadelphia and Pittsburgh required less than a week, although delays related to washouts, repairs, and queues to get into the lock were common.

A weighlock measured the weight of the boat loaded with cargo; tolls were calculated based on the number of tons transported per mile. When the water was drained from the chamber, the boat came to rest atop a set of scales. The weight of the empty vessel was first calculated and a nail was driven into the hull at water level, and again after every two tons were added. When the total weight was established, the weighlock was refilled, the gates opened, and the boat moved on.[50] Initially, for instance, agricultural products were assessed at 2 cents a ton-mile, coal and iron ore at 1 cent per ton-

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45 Hulbert, 211.

46 McCullough, 43.

47 McCullough, 139.

48 McCullough, 120.

49 McCullough, 95.

50 McCullough, 116.

mile.

Along the way, passengers could sit on top of the boat and take in the fresh air and passing scenery visible over the berm walls. At the cry "low bridge," everyone quickly lay down on the roof to avoid injury, as the boat passed beneath the bridge with only inches to spare.

Aqueducts carried the canal over periodic chasms and rivers. An aqueduct resembled a bridge, but rather than a roadway, the structure supported a water-filled trough. Sometimes a dam was built across a river, creating a slackwater pool in which the current was calm enough to cross in a canal boat. Gates, or waste weirs, controlled the water level during spring freshets to protect the canal from washing out. Sometimes the absence of sufficient water created the need for a dam and reservoir to conserve water for use during dry summer months. Feeder canals often provided an additional supply of water.

Around the perimeter of basins, large bodies of water adjacent to the canal where boats were loaded and unloaded, warehouses and stores erupted into the town's busiest commercial center.[51]

The state constructed its own mill in Johnstown to produce hydraulic cement used in constructing the canal's underwater infrastructure. If the canal was located in a region of porous rock, a multi-layer lining of clay was needed to provide a seal. Over the shipping season, holes were invariably made in this "puddling" by animals or careless boatmen using illegal, metal-tipped bargepoles. These holes were quickly repaired to prevent serious leaks.

As a protective measure for the cargo, sectionally built canal boats had been suggested in 1826 by Canvass White, though they were not implemented until 1834 as developed by John Dougherty of the Reliance Transportation Line. The design--intended to facilitate passage on the Portage Railroad--prevented goods from being damaged by excessive handling, and if a leak occurred, the entire cargo would not be lost.[52] Sectionalization also reduced the available cargo space in each vessel, however.[53] Dougherty, an opportunist, then sold his plans for the three-section boat to Peter Shoenberger, and immediately designed and marketed a four-section craft.[54]

"All roads led to the canal," was the popular catchphrase during the peak shipping years, from 1829-54.[55] In 1847 historian I.D. Rupp agreed, "These public works were finished about twelve years ago, and since their completion, have completely changed the mode of carrying the surplus produce of the country and other articles of commerce."[56]

The Pennsylvania Main Line never achieved the success of the Erie Canal, however. Construction cost slightly more than $10 million, vastly exceeding original estimates. The state could afford only to make the most essential repairs and pay the salaries of its many employees: contractors,

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51 Henry Wilson Storey, History of Cambria County, Pennsylvania (Chicago: Lewis Publishing Company, 1907), 336.

52 McCullough, 100; Shank, 35-36.

53 Stephenson, Pennsylvania Canals, 16.

54 Storey, 341.

55 Stephenson, Pennsylvania Canals, 29.

56 I.D. Rupp, History and Topography of Northumberland, Huntingdon. . .Counties (Lancaster, Pa.: G. Hills, 1847), 203.

construction workers, lockkeepers, canal inspectors, and engineers. By 1843 when public debt for the state-run project reached $40 million, the legislature voted to sell the Main Line for $20 million, with the stipulation that the buyer continue to operate the system.[57]

In contrast, the New York canal was wildly successful: it generated sufficient toll income to facilitate upgrading almost immediately, and its less-formidable topography required only eighty-two locks along 363 miles. The Pennsylvania Main Line's rugged course necessitated 167 locks over 276 miles.[58] Also, initial plans had been incomplete, even as construction got under way, and the project was poorly timed. Rapid development made in locomotive technology between 1835-45 rendered the Allegheny Portage Railroad, the single-most expensive portion, obsolete before it was completed because of the complexity of the mechanism and its inability to keep up with the heavy volume of traffic that presented itself with a few years.[59]

The financial embarrassment was not lost on the state: "The present deranged condition of State finances, and the utter prostration of the credit of the commonwealth have now put a stop to the public works. The time has come for serious consideration upon the means of extricating Pennsylvania from her present embarrassed condition."[60]

Although the state lost money on the Main Line Canal, the citizens of western Pennsylvania profited considerably by it. The canal was more efficient and reliable than existing methods of transportation in the 1820s-30s: overland roads and river traffic. Using the crude bridlepaths, it took a traveller about twenty-five days to go from Philadelphia to Pittsburgh, a distance reduced to twelve to fifteen days by turnpike; but by canal or rail, the voyage took only a few days.[61] The Pennsylvania Main Line also competed with New York as a major east-west route, successfully introducing immigrants and new settlement to western areas of the state. The canal opened the market for Pennsylvania's vast mineral resources, along the way supporting travel-related businesses such as inns, taverns, canal-boat builders, and operators of passenger and freight lines. In sum:

> The building of the Pennsylvania Canal is generally looked upon asan unfortunate episode in the history of Pennsylvania, and while, considered as an investment, it was undoubtedly a losing one, it still had the effect of opening the country and of attracting to the western part of the state a sturdy population, most of whom otherwise might have gone West by the more favored route of the Erie Canal.[62]

PENNSYLVANIA RAILROAD

As Pennsylvania was completing the Main Line Canal, private individuals began to develop

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57 McCullough, 34.

58 McCullough, 148.

59 McCullough, 143, 150.

60 Source unknown.

61 Charles Trego, A Geography of Pennsylvania (Philadelphia: Edward Biddle, 1843), 151.

62 U.S. Senator George T. Oliver, in an address before the Western Pennsylvania Historical Society (March 18, 1916), cited in McCullough, 153.

minor railroad routes. The first were the Mauch Chunk Railroad in 1827, and the Carbondale and Honesdale Railroad--both designed to carry raw materials to nearby canals. By 1833 the Philadelphia and Reading Railroad published freight statistics that showed Main Line tonnage shipped on their route exceeded that of the Erie Canal.[63] Because the Main Line canal remained more accessible to a greater area, however, it dominated freight and passenger service.

People soon realized the railroad was no longer a mere rival to the state's canal, it had become the only viable mode of transportation for the future.[64] The Pennsylvania Railroad applied for a charter in 1846 to construct a rail line from Philadelphia to Pittsburgh, which clearly threatened the already-struggling canal. The company quickly began to lay rails from Harrisburg to Hollidaysburg, utilizing the Columbia and Portage Railroads of the Main Line Canal. The Pennsylvania system followed the most practical geographic route--an area that very nearly paralleled the canal. Speculation, construction, and growth occurred there in anticipation of the railroad, not unlike the years just prior to the canal.

Between 1849 and 1851, the Pennsylvania Railroad laid connections between Harrisburg and Johnstown, and began another route over the mountains to bolster its system, including Horseshoe Curve, west of Altoona.[65] Because of a 2,200-foot difference in elevation, this section of track was designed in a U-shape, which necessitated a 1.8 percent grade[66]. The New Portage Railroad, or the Mountain Division opened in 1855 although not quite finished; henceforth the original Portage Railroad was no longer used.[67] That same year the canal commission slashed the price of the Main Line canal to $10 million, while retaining the stipulation that the buyer:

> Shall . . . keep in good repair and operating condition, the entire line of said railroad and canals, extending from Philadelphia to Pittsburg (sic), with the necessary toll houses, water stations, locks, buildings and other appurtenances, and that said railroads and canals shall be, and forever remain, a public highway.[68]

Facing economic and political pressure, the governor put the debt-ridden canal on the market again. In October 1857, its nemesis, the Pennsylvania Railroad Company, purchased the canal for the bargain price of $7.5 million without the previous agreement to maintain complete service. Some groups objected to the monopoly this gave the railroad, while others favored the idea because it would provide reliable, year-round transportation as well as purge the government of the poorly managed and politically misused "Old State Robber."[69]

Three months after the canal's sale, however, the Pennsylvania Railroad Company realized its

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63 Wayland, 686.

64 Schotter, 28.

65 Schotter, 26.

66 Edwin P. Alexander, The Pennsylvania Railroad: A Pictorial History (NY: Bonanza Books, 1967), 47.

67 McCullough, 157.

68 McCullough, 158.

69 Schotter, 46; Thomas J. Chapman, The Valley of the Conemaugh (Altoona: McCrum and Dern, 1865), 97-98.

folly, closed the Portage incline, and the iron apparatus was removed.[70] The Main Line was closed section by section, beginning with the Western Division. The Juniata Division was the last to operate, until 1864-76, while other sections were allowed to simply dry up. The canal towns, left stranded along a stagnating channel of odorous water, like the turnpike towns before them, slowly began to fade. By 1879 the once-important shipping center of Hollidaysburg at the base of the Portage Railroad was described as "but the shadow of its former self," while the canal lay "with ruined locks and broken bridges, a relic of early American engineering," and few traces of the Old Portage or New Portage railroads were evident.[71]

"It is the intention of the Company to not permit any use of the canal grounds either to travel upon or make crossings over or otherwise," reported The Watchman in 1890. "This is done to keep people from infringing upon their rights." The following year the canal was filled in and affiliated structures dismantled, thus ending a social and economic era for the adjacent towns.[72]

Localities along the railroad then began to experience the growth and prosperity previously monopolized by the canal towns. Altoona, for instance, was developed specifically as a railroad-company town. The Pennsylvania Railroad was instrumental in establishing newspapers, schools, libraries, and similar institutions there.[73] In 1858 it acquired a number of smaller branch canals and constructed numerous additional rail lines across the state so that soon the Pennsylvania Railroad branched out into neighboring states.[74]

COMMERCE AND INDUSTRY

The Conemaugh and Juniata river valleys are separated by the north-south axis of the Continental Divide. Both valleys contain fertile soil, dense timberland, and a multitude of streams. The land is rich with iron ore, bituminous coal, lead, alum, salt, and other minerals said to be "efficacious in certain diseases."[75] Resources specifically applicable to residential and commercial construction were at hand: fire clay for making bricks, gypsum used in plaster, limestone, sandstone, slate, and "mineral paint beds" containing ochre and umber pigments.[76] This variety of resources is reflected in the diverse regional building stock.

Until 1860 Pennsylvania was the nation's leading producer of wheat, rye, and grass seed, as well as the North's leading producer of Indian corn. It ranked second to New York in the production

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70 McCullough, 164; Africa, 36; Schotter, 47.

71 McCullough, 164, 166, 172; James Dredge, The Pennsylvania Railroad: Its Origins, Construction and Management (NY: John Wiley and Sons, 1879), 5-6,

72 Albert Rung, "Waning Canal Days in the Juniata Valley," Daily News (28 January, 1967).

73 Dredge, 23.

74 Klein, 26.

75 Source unknown.

76 Jordan, 13; Chapman, 15; I.D. Rupp, Geographical Catechism of Pennsylvania. . . (Harrisburg: John Winebrenner, 1836), 25; Stewart, 69; Samuel T. Wiley, Biographical and Historical Cyclopedia of Indiana County (Philadelphia: John Gresham & Co., 1891); reprint, Closson Press, 1982.

of buckwheat, fruit, hay, oats, and animals for slaughter.[77] Despite the importance of other industries, agriculture remained the chief occupation for many years.[78]

The Juniata Valley, east of the Alleghenies, was especially noted for the production of grains and grasses. The soil in the Conemaugh Valley, west of the mountains, was "not too rough for cultivation, [and] is tolerably fertile, producing crops of wheat, oats, grass, &c."[79] It was, however, "too rich" to sustain the production of grain unless the soil was first depleted by harvests of hemp or Indian corn.[80] In addition to the crops themselves, products include flax, flaxseed (linseed) oil, beeswax, honeybutter, cheese, and wool. Horses, cattle, and sheep also were raised in large numbers and driven to eastern markets.[81]

Agriculture-associated industries in the region included woolen mills, gristmills, flourmills, and breweries. The Juniata served woolen factories, and throughout the Conemaugh Valley threshing machines and "hay elevators," or harpoon hay forks, were manufactured. Conemaugh-produced grain supplied the ingredients for strawboard mills and starch factories.[82]

Other regional industries included blacksmithing, tanning, and sugaring, and Juniata Valley Meridian sandstone was crushed for shipment to Pittsburgh glassworks.[83] Some architectural supplies came from a nail factory and water-powered saw and chopping mills; a sash, door, and blind factory was also based in Indiana County.[84] The lumber industry provided materials for sawmills and similar enterprises. It was used to make tools, guns, cabinets, spinning wheels, wagons, sleds, framing members, lath, clapboards, bridge and ship members, and barrels. Raw lumber was used for charcoal, railroad ties, cordwood for locomotives, rafts, potash, and pearlash. Oak and hemlock bark was used in tanning leather for harnesses, saddles, and shoes.[85]

One of the earliest iron furnaces in the Juniata Valley was established in the Juniata Valley after the Revolutionary War. In 1785 the Bedford Furnace and Forge was built by George Ashman, Charles Ridgely, Thomas Cromwell, and Tempest Tucker, and by 1817 many more such works were operating.[86] The first fumace west of the Allegheny Mountains was located on Jacob's Creek about

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77 William M. Cornell, History of Pennsylvania from the Earliest Discovery to the Present Time (Philadelphia: Quaker City Publishing House, 1876), 266.

78 John W. Jordan, A History of the Juniata and Its People (NY: Lewis Historical Publishing Co., 1913), 298.

79 Trego, 259.

80 Stephenson W. Fletcher, Pennsylvania Agriculture and Country Life (Harrisburg: Pennsylvania Historical and Museum Commission, 1971), 144.

81 Stephenson, 175th, 533; Trego, 259.

82 Trego, 257; Africa, 425; Stephenson, 175th, 236-39.

83 Egle, 777.

84 Trego, 257; Africa, 425.

85 Stephenson, 175th, 211, 527-28; Fletcher, 329.

86 Rupp, 36.

1790.[87] Iron manufacture soon became one of the leading regional industries, with shipping as far as Louisville, Cincinnati, and New Orleans; Juniata Valley iron had an international reputation of excellence.[88] In 1865 the Cambria Iron Works in Johnstown on the Conemaugh River was described as the "largest and most complete ironworks in the Union, if not in the world."[89]

Ironworks required a supply of quality iron ore, timber to use as charcoal for fuel, lime, and relative proximity to a dependable market, transportation route and water source for power. The Juniata and Conemaugh valleys provided it all. Prior to 1880 Pennsylvania led all other states in the production of pig iron and mining of iron ore, a claim later relinquished to Michigan and Minnesota.[90] Pig iron and, to a lesser degree cast pots, pans, skillets, kettles, dutch ovens, and firebacks, were produced in a blast furnace. The pig iron was refined by heating and hammering into iron bars, which blacksmiths used to make tools: tire irons, axes, hoes, shovels, chains, scythes, horse shoes, wagon wheels, nails, hinges, and bolts.

Salt was first discovered near Saltsburg in the Conemaugh Valley about 1812-13. Considered so valuable that "no one was permitted to walk heavily over the floor while the operation of measuring it was going on," a bushel of salt was at one time worth "a good cow and her calf."[91] By 1836 the Conemaugh, Kiskiminetas, and Allegheny rivers were heralded as possessing the "most productive saline springs in Pennsylvania . . . ."[92] By 1840 Pennsylvania was the leading U.S. producer of salt.[93]

Early salt supplies were shipped to Pittsburgh by keelboat or wagon. Although, as historian Thomas Chapman reported in 1865, "The canal which was afterwards made to pass through this region, brought the most available means of transportation to these works, and salt formed one of the chief staples of commerce of that section, and was carried to every part of the country."[94]

Between 1819 and 1826 competition drove the price of salt as low as $1 per barrel. By 1854 measures were taken to eliminate threats from foreign salt manufactors. Major S.S. Jamison of Saltsburg introduced a bill to the state legislature that would have imposed a duty on imported salt. But in the 1860s salt produced more cheaply in Michigan, transported via Great Lakes, contributed to the abandonment of the Western Division of the canal.[95]

CONCLUSION

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87 Cornell, 283.

88 Stephenson, 175th, 68.

89 Chapman, 13.

90 History of the Juniata Valley in Three Volumes (Harrisburg: National History Association, 1936), 315.

91 Fletcher, 186, 405.

92 Rupp, Geographical Catechism. . ., 37.

93 Fletcher, 406.

94 Chapman, 63.

95 Stephenson, 175th, 523.

The settlement and subsequent development of the horizontal corridor in which Alexandria and Saltsburg lie in southwestern Pennsylvania is common to all the towns founded in association with the Pennsylvania Canal. They evolved as independent municipalities, however, with characteristics individual enough to warrant separate investigation based on location, mineral wealth, and commercial foundations. Findings presented in this overview support a chronology that begins with a period of early settlement, from the mid-eighteenth century to the late-1820s, when the canal was planned and under construction. The heyday of the canal itself occurred from this point through mid-century, during which the Pennsylvania Main Line Canal was the single-largest impetus for the maturation of adjacent towns and industries.

The canal and railroad coexisted for a short period, which varied according to locale, when both were operated under the dominating ownership of the Pennsylvania Railroad Company. Upon the demise of the canal came the railroad era; it overtook--literally and figuratively--the canal and shifted regional development to towns along the tracks and ongoing coal and iron-ore industries. And last, local economic decline and the departure of the railroad entirely during the twentieth century, when both towns were left without a major transportation entity. Alexandria and Saltsburg were thus purged of their primary economic benefactor and henceforth remained static but stable, witnessing little or no significant economic advancement.

Within the chronological sequence of canal-specific events, there are cultural facets to the two developing communities that contribute to a more three-dimensional sense of time and place, specifically: transportation (trail, river, pike, canal, railroad), commerce and industry (mercantilism, extractives, agriculture, food and lodging, manufacturing, professionals), and community (education, ethnicity, religon, social and fraternal organizations). Collectively, this data presents an appropriate historical context in which to assess the architectural resources of the canal towns Alexandria and Saltsburg.

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PROJECT INFORMATION

This project was conducted by the Historic American Buildings Survey/Historic American Engineering Record in cooperation with the America's Industrial Heritage Project under the directorship of Randy Cooley; AIHP is an undertaking of the National Park Service, based in Hollidaysburg, Pennsylvania. Recorded under the direction of Robert J. Kapsch, chief of HABS/HAER, the project was completed during summer 1988 at the HABS field office in Johnstown, Pennsylvania. Project leader was Alison K. Hoagland, senior HABS historian; field supervisor was Dorothy Burlingame, University of Vermont; project historians, Kristin Belz, University of Virginia and Karen Genskow, Sangamon University. Large-format photography was by David Ames. Editing of the final report was done by Sara Amy Leach, HABS historian.

This report was completed as part of a larger project documenting two canal towns--Saltsburg, on the Western Division of the Pennsylvania Mainline Canal, and Alexandria, on the Juniata Division--flanking the Allegheny Divide. Twenty-two reports on individual buildings in Saltsburg, an overview history of Saltsburg (HABS No. PA-5438), twenty-two reports on buildings in Alexandria (Huntingdon County) and an overview history of Alexandria (HABS No. PA-5407) are also available. Results of the project were published as Two Historic Pennsylvania Canal Towns: Alexandria and Saltsburg, Sara Amy Leach,

editor (Washington, DC: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, March 1989). This report was Chapter 2 of that publication.

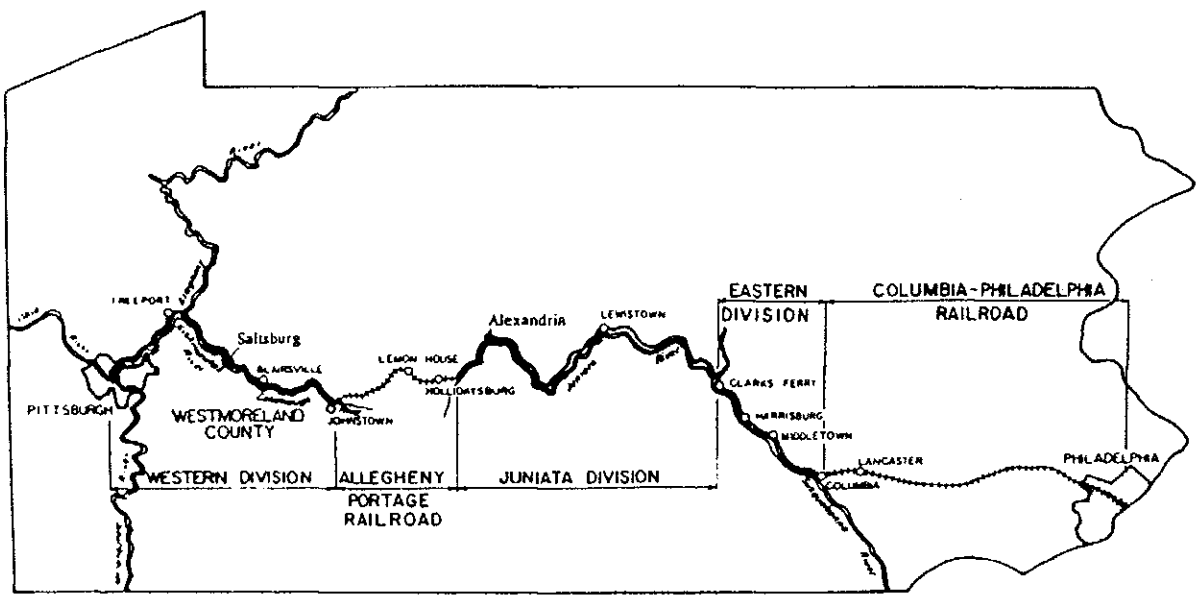

Fig. 2.1 Map of the Pennsylvania Main Line Canal (Dennis Semsick and George B. Johnson, Saltsburg and the Pennsylvania Canal, 1984).